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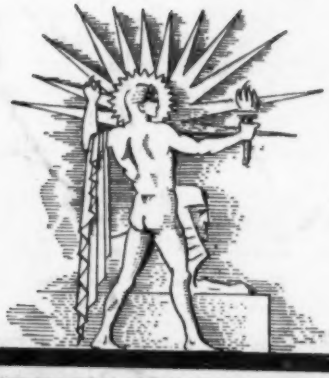
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



June 21, 1941

You Are Safe

See Page 393

A SCIENCE SERVICE PUBLICATION

Do You Know?

One-half of the *timber* volume in the United States is in the Northwest.

By providing *irrigation,* Grand Coulee Dam will create at least 20,000 new farms.

Eight-sided *revolving libraries* as tall as 60 feet were built in some medieval Buddhist temples to house the numerous scrolls.

Present war tactics are apparently causing more *casualties* among civilians than among armed fighters, a medical publication reports.

The idea of passengers and mail landing by *parachute* from a steam flying machine was pictured by an imaginative artist of about 1830.

Helpful for Philippine self-sufficiency is a recent invention which makes it possible to run automobiles on a charcoal gas from *coconut* shells.

A British *population* expert says that efforts to control or influence population increase are as old as the Babylonian code of Hammurabi, about 2000 B. C.

Kish, name of a famous Bible town, is also familiar in steel industry as the name of a powder-like graphite, which separates from molten iron in cooling.

Popular names given to the famous *bighorn sheep* of the West include: mountain sheep, Rocky Mountain bighorn, American ibex, sheep deer, and wild sheep.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

AERONAUTICS

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When will the "vanishing Indians" be back to their 1492 numbers? p. 397.

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PSYCHOLOGY-PSYCHIATRY

Why should odd-looking men be barred from the Army? p. 394.

RESOURCES

How has the war affected bird banding? p. 392.

Where are cork trees now being grown? p. 397.

A *halibut* lies on its left side and both its eyes are on the right side.

About 45% of United States *steel* exports in 1940 went to the United Kingdom.

Germany is reported to be using *zinc* to replace aluminum in making slide fasteners.

Tuna fish are supposedly rare in Australian waters, but air surveys show that some species are numerous there.

● RADIO

Thursday, June 26, 2:45 EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Charles C. Williford, in charge of Springfield, Mo., Weather Bureau, will discuss thunderstorms.

Listen in each Thursday.

Attempts are being made to introduce *abaca,* or Manila hemp, to the American tropics.

Finishes that will make *silk stockings* resistant to snagging and abrasion are a goal of laboratory experiments.

SCIENCE NEWS LETTER

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MEDICINE

Fits Produced As Protection Against Epileptic Seizures

Shocked Electrically into Seizures in Safety of Physician's Office, Epileptics May Be Spared Dangers

A SORT of vaccination against epileptic fits to protect both public and patient against sudden seizures in traffic, at work and under other dangerous conditions, is about ready for practical use.

The epileptics are literally shocked through the brain, electrically, into their seizures which occur safely in the privacy of a physician's office.

Dr. Lothar Kalinowsky and Dr. Foster Kennedy, New York psychiatrists, suggested this new method to the American Neurological Association meeting at Atlantic City. It upsets ideas physicians have had about this disease.

Shocks of over 100 volts are deliberately administered to the brains of patients. This electric shock treatment is identical to that used in treating schizophrenia (dementia praecox). Dr. Kalinowsky originally introduced in this country this other electric shock treatment.

Producing one fit to protect a person from having another one later is a novel idea. Physicians have supposed epilepsy to be a sort of self-perpetuating disease—each fit making the patient more susceptible to the next.

In the experiments by Dr. Kalinowsky and Dr. Kennedy, the epileptics first went for a period without the luminal they had been taking to prevent seizures. Then each was given a 60-volt electric shock. This failed to produce a fit, although 60 volts is enough to bring on a fit in some non-epileptics—85 volts being the average amount necessary. Gradually the current was stepped up. Only when 100 volts was reached did a fit result.

After the first convulsion, it was necessary to step up the current even more to produce a second one. This time it took 115 volts.

One patient had such a high threshold of sensitivity to the shock that convulsions could not be produced even with the highest current used in the electric shock.

When a convulsion occurs, however, it is always at maximum strength. Stepping up the current more makes no change in its intensity. That is purely a matter of muscular development.

The fits produced are identical in every way with ordinary epilepsy, the experimenters found.

Low currents produce a "petit mal" state, a familiar occurrence in epileptics. Increasing the voltage produces a real convulsion after a latent period. Stepping it up still more brings on the seizure with a very short or no latent period. All these gradations between a short petit mal and a generalized convulsive seizure are comparable to what happens in epileptics.

Various neurological measurements and observations of patients in intentionally produced fits are throwing entirely new light on epilepsy, ordinarily so difficult for physicians to observe. Opportunity for scientific study is particularly rare in the case of petit mal which comes on without warning and sometimes even without the knowledge of the patient.

Science News Letter, June 21, 1941

MEDICINE

Unborn Infants May Get Deadly Brain Disease

UNBORN infants may contract a deadly brain disease from their mothers who are themselves apparently

TRAINING CLASS

Making a picturesque sight with their equipment are these four apprentice welders, taking part in the U. S. Steel Corporation's program of training workers for skilled jobs, to meet defense requirements.

immune, Dr. Abner Wolf, Dr. David Cowen and Dr. Beryl H. Paige of Columbia University College of Physicians and Surgeons state (*Science*, June 6). The disease is a form of encephalomyelitis, and it is caused by a parasitic one-celled animal known as Toxoplasma.

In some cases, the luckless babies are born dead, in others, perhaps even more unfortunate, they survive only to run the gantlet of crippling or fatal disease after they are born.

The three doctors are making efforts now to find means of detecting the infection in seemingly healthy mothers, in order to prevent its occurrence in their children. It is hoped, they add, that serological tests and eventually a curative agent will make this possible.

Science News Letter, June 21, 1941

MEDICINE—PSYCHIATRY

Infantile Paralysis Victims May Get Disease Again

American Neurological Association Hears Reports of Animal Experiments; Alcohol Disease Occurs in Fish

RECOVERY from one attack of infantile paralysis is no insurance against further assaults by this dread disease, Dr. Howard A. Howe, Johns Hopkins University, and Dr. David Bodian, University of Chicago, told the meeting of the American Neurological Association in Atlantic City.

They reported experiments with animals that show that immunity resulting from the disease is local, just where the virus has travelled along the fiber pathways of the nervous system. Animals convalescing from an attack which affected the brain were able to contract the disease again through the nose. And two monkeys that had had an attack of infantile paralysis confined to a limited section of the spinal cord, contracted another typical case of the disease in the previously uninvaded portion of the central nervous system.

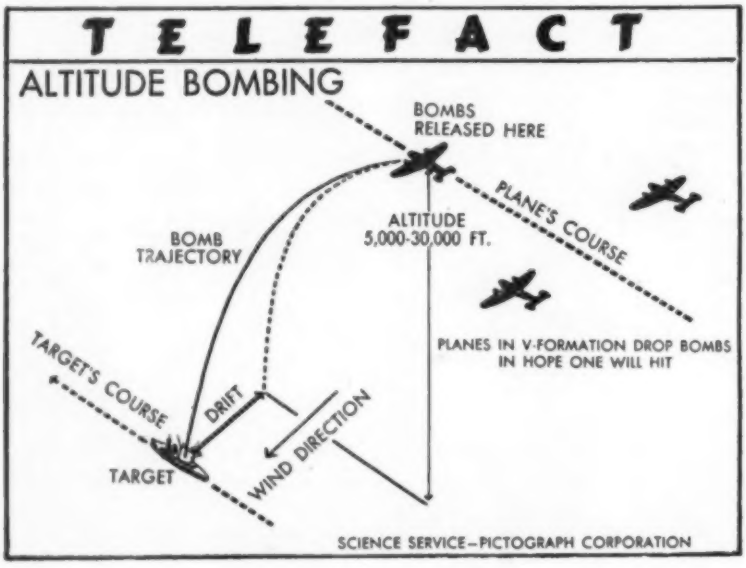
Science News Letter, June 21, 1941

Fishes Need Vitamins, Too

EVEN fishes and foxes may need their vitamins, too.

Allowed to over-indulge in a diet of raw fish, both these creatures were observed to develop spontaneously a disease identical with the alcoholic disease caused in man by lack of thiamin (vitamin B_1), it was revealed at the meeting.

Both the foxes and the fishes can be cured of their trouble by the vitamin, Dr. Leo Alexander, of Boston, and his associates Drs. Robert G. Green, C. A. Evans and Louis E. Wolf told the meeting.



The human disease, known as Wernicke's disease, has been produced experimentally in animals by Dr. Alexander and other colleagues when they fed them a diet deficient in vitamin B_1 but over-abundant in other vitamins, particularly riboflavin, nicotinic acid or vitamins A and D. The excess of the other vitamins, they concluded, had so raised the vitamin B_1 needs that the resulting deficiency was greater than it would have been otherwise.

What happens to the blood chemistry in thiamin deficiency or Wernicke's disease, was described to the meeting by another group: Drs. Herman Wortis, Norman Jolliffe, Martin H. Stein, and Ernest Bueding. In both these conditions, the blood's pyruvic acid is invariably increased.

When normal individuals are fed glucose, the blood pyruvate is increased, but returns to normal within three hours. In Wernicke's disease this increase is very high and the return to normal is delayed. Feeding thiamin to the patient brings the blood chemistry back toward normal.

Although Wernicke's disease is always associated with lack of thiamin, these investigators said, their observations indicate that it is also due to lack of other nutritive essentials.

Science News Letter, June 21, 1941

Mental Treatment Safer

THE mentally ill may be shocked back to sanity by metrazol without the danger of severe convulsions if two drugs reported to the neurologists prove effective in clinical use.

A safe drug, easily prepared, which may be used with metrazol to make the convulsions less severe and reduce the danger of the patients' breaking their own bones through violent contractions, has been sought and found by Dr. B. J. Alpers and Dr. H. E. Yaskin, Philadelphia psychiatrists. It is magnesium sulphate (Epsom salts), they reported. This familiar drug, given just before the metrazol, protects the patients from fractures, softens the convulsions and in some cases even abolishes entirely the violent muscular contractions.

The other chemical, pyridine, and some of its derivatives, were reported by Dr. Lewis J. Pollock of Chicago with Drs. I. Finkelman and Eli Tigay.

These chemicals, the investigators suggested, are able to prevent or reduce the severity of the metrazol convulsions by counteracting toxins in the patient.

The magnesium sulphate, it is believed, acts by paralyzing temporarily the muscles, so that although the metrazol still produces a violent discharge of energy from the brain it is prevented from producing corresponding contractions in the muscles.

The Indian arrow poison, curare, has previously been used for this purpose, but is difficult to obtain.

Science News Letter, June 21, 1941

Clashes Threat to Nation

CLASHES between labor unions, business men and politicians threaten the health of the nation just as conflicts in an individual produce insanity, the American Neurological Association was told.

National obedience to social health laws can cure the disease of clashing interests just as the physician can restore health to broken personalities, Dr. Edward A. Strecker and Dr. Kenneth E. Appel, of Pennsylvania Hospital, University of Pennsylvania Medical School, declared.

Work and the satisfaction of accomplishment are prescribed by these psychiatrists as protection against national as well as individual disorders of the emotions and mind. An understandable but unfortunate emphasis on money and material standards has kept many from work, they said, because of the insistence on higher wages and no work, rather than lower wages and wholesome work.

"It is a serious question," the report stated, "whether labor unions in the fight for more equitable conditions of life and work did not unwittingly decrease opportunities for employment and thereby spread the disease of enforced idleness.

"And now in the face of world emergencies, disputes on hours of work and wages are frequently holding up defense production, when perhaps the only guarantee of freedom for any possible discussion of such matters and the only possibility of decent wages at all in the future, depends on speeding production.

"It is as if two firemen should discuss as to who was to hold the hose and who should turn on the hydrant when a fire was rapidly consuming a house."

The experience of unhealthy dependency produces helplessness and insecurity and resulting fear which makes the individual demand more help and support, the psychiatrists said. This is true whether the dependency is that of a child on his parent, the unemployed on the government, or the wealthy on their fortunes.

"Millions of our people are developing characteristics that are not only unwholesome but a serious burden on and threat to our economic and cultural sanity," they declared.

"Malignant tendencies exist on both sides of the economic fence. We must not unnecessarily contrast the interests of the different classes nor exaggerate their differences. A realization should be cultivated that all groups are standing on common ground and unless they pull together all will suffer and perhaps be lost."

Science News Letter, June 21, 1941

ECONOMICS

Japan's Latest Bottleneck Is General Labor Shortage

Last Year Thousands of 12-Year-Old School Children Worked in Heavy Industries, Chinese Economist Says

PLAGUED by numerous bottlenecks, Japan has a new bottleneck threatening its precarious war economy—shortage of labor, any kind of labor.

So the situation is analyzed by a Chinese economist, Dr. T. Y. Hu of the Chinese Economic Council, in a new report on *Japan's Economy Under War Strain*.

Labor shortages, which at first affected skilled workers, have spread to the general supply and Japan has now tapped every available inexpensive source, Dr. Hu concludes, citing these indicators:

Last year, thousands of children 12 years of age just out of grade school were recruited for heavy industries. Pressure was exerted to get Korean workers to come to Japan, bringing 35,000 out of an expected 85,000. The ban on women working in mine pits has been lifted. About 25,000 prison inmates have been put to work producing munitions.

To expand current output now—and Japan's schedule for the fiscal year ending April 1942 calls for 11% increase in "available national income"—the war-strained country is trying to get more production out of its plants and enterprises, Dr. Hu states. The attempt is being made to transform Japan's innumerable small-scale enterprises into more efficient units.

That individual efficiency is unlikely to be pushed farther is indicated by statistics of factory injuries, industrial casualties and relative retardation of growth among working youths, which are attributed to long working hours and hard working conditions.

Trying to expand "available national income" 11%, Japan cannot hope to borrow, and her gold store must now be dwindling fast, Dr. Hu further points out. The increasing burden must be shouldered mainly by civilians taking further cuts in their standard of living, which endangers the stirring of war-weariness and discontent.

That war economy is straining Japanese people so acutely that even the traditionally patriotic, docile, and persevering Japanese are restive, Dr. Hu infers from official attempts to appease the masses and other political trends. No signs of social revolution loom on the horizon. But it is considered not impossible that increasing war strain may breed anything from "a palace revolution" to a popular movement against continuance of war.

Japan is more dependent on foreign trade for war materials than ever as the international situation advances, Dr. Hu reports. More than four-fifths of Japan's vital war imports, he states, must come from "her two main rivals, the United States and the British Empire."

The report adds: "Unless Japan can have continued access to the material resources of the United States and the British Empire, and of areas within the range of their influence—whether through normal trade channels or as a special diplomatic concession—she can never hope to develop sufficient strength even to cope with the 'China Incident,' let alone to realize her grandiose dream of the 'Greater East Asia Co-Prosperity Sphere'."

Science News Letter, June 21, 1941

German troops sing as *breathing exercise* as well as for morale, says an American who soldiered in Germany, and he adds that some army songs are written to require deep inhaling and exhaling.

PSYCHOLOGY

Color-Blindness Test

Representatives of 13 Technical Groups Evolve New Measure Consisting of Matching Metal Chips

By EMILY C. DAVIS

A NEW and foolproof test for color-blindness, which consists of matching color chips, is one of America's latest scientific achievements, valuable to national defense and generally useful, besides.

"Are you color-blind?" is an important question these days. Important to know about prospective soldiers. Important for drivers of all kinds of motor vehicles, for railroad engineers, for many others who may be expected to read color signals with ease and speed.

No less than 5 per cent. and possibly as many as 10 per cent. of the men in the world are color-blind. So the estimates run. No census has ever counted all the men who confuse red and green, or have other difficulties in seeing or distinguishing rainbow hues.

Taking the lowest estimates, 50,000 men in a million have some form of this hereditary visual condition. Women transmit the trait, but are rarely affected.

America's new color-blindness test shows in less than two minutes whether an individual has any serious defect of color vision. So Miss Dorothy Nickerson, secretary of the Inter-Society Color Council, explained in an interview.

Special Committee Formed

A committee appointed by the Inter-Society Color Council, under the co-chairmanship of Dr. Forrest L. Dimmick, head of the Psychology Department at Hobart College, and Carl E. Foss, color consultant, of New York City, has devised the new test, and has already produced some sets for experimental use. The test is not yet standardized or marketed.

Taking the test, an individual is shown a row of about a dozen attractively colored chips of enameled metal. They are lined up on a neutral background. One at a time, from a matching set, chips are handed to the person taking the test. He must place each one below the chip that it seems to match.

Matching these small squares of color, a color-blind individual makes mistakes, and the mistakes are quite unlike those of the person with normal color vision, who might peer closely and choose cautiously before placing a chip below the very best match. The color-blind individual may decide to place a medium gray chip below a purple chip, because the tones look the same to him.

"Every school child," said Miss Nickerson, "could be easily tested for color-blindness, if the test becomes the accepted standard."

Nothing to Hide

Scientists who have studied this condition feel that color-blindness is not a thing to hide, or to be depressed about. A color-blind person cannot expect to do certain kinds of work. But every one has personal handicaps and limitations. The worry and waste that color-blindness generally causes are due to not finding out about it, and adjusting to it.

What sort of waste and worry?

"Well," Miss Nickerson answered, "young men have been known to enter surgical training without knowing until then that they were color-blind. In surgery, color vision is sometimes very important. Color of blood, for instance, changes as ether is administered, and the blood by its changing color may give a warning signal, calling for quick action by the surgeon. A young doctor with a defect in color vision would not be nearly so handicapped in general medicine.

"And there was waste in the case of a young man who decided to be an auditor. At school, he realized that he could not tell red entries from black, and began to worry for fear he had chosen a career that he could not follow. The school, perhaps unfamiliar with color-blindness, reassured him. Red ink was not so widely used, any more. He would get along all right.

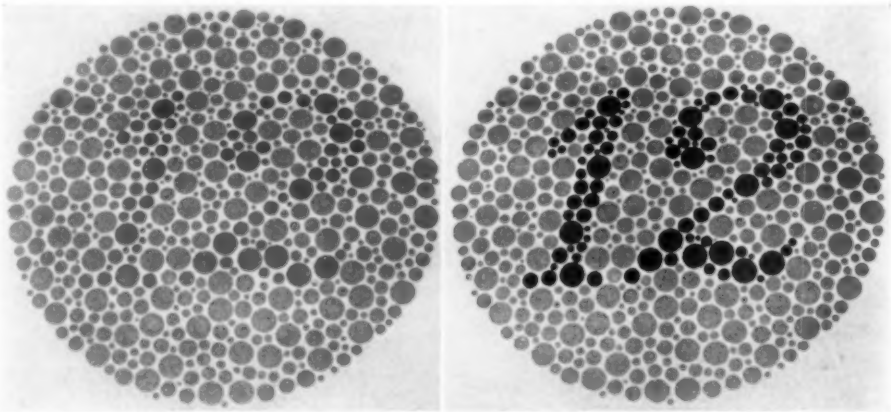
"But entering business, this color-blind young auditor did have difficulties, encountering red ink problems. He might have been happier and more successful in another commercial line, which had no color signals."

The U. S. Army and Navy are taking strict account of color vision in testing recruits, and the new test is likely to be very helpful to them.

Barred From Navy

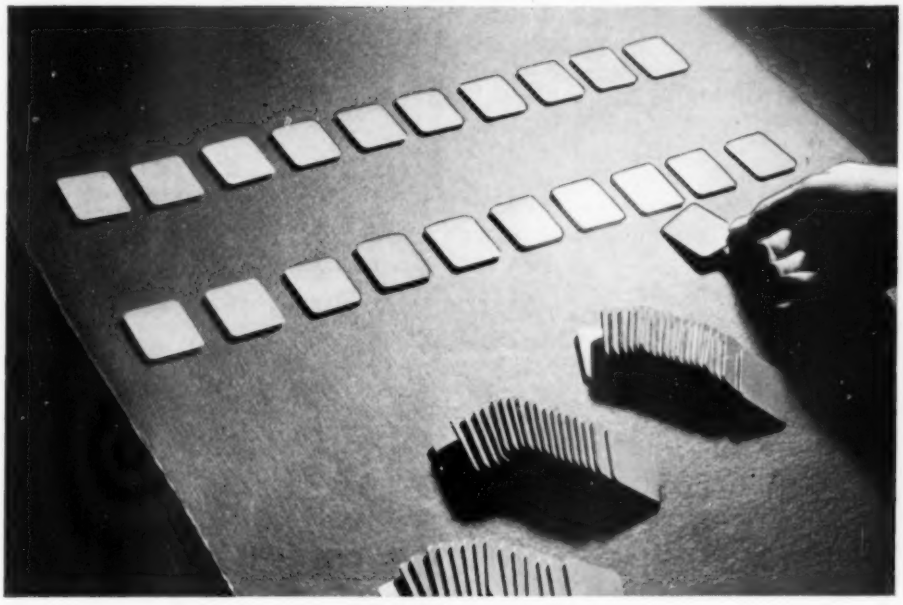
The U. S. Navy takes no recruit who cannot distinguish primary colors. Aboard ship, explains the recruiting service, a man must take his turn standing watch, and inability to distinguish red lights from green—one common form of color-blindness—is too great a handicap for a sailor or officer.

The Army, while equally insistent on knowing whether a prospective recruit or selective service man has any form of color-blindness, does not bar a



MOSAIC TEST

You have heard that color-blind air observers detect certain kinds of camouflage. A normal observer using a color filter might do the same trick. The "color-blind" camera shows what happens: A red 12 on bluish-gray ground of the same lightness is hidden when photographed with a common type of film. Through a green filter the red 12 looks dark. A red filter, on the other hand, would show it light. This is a card from one of the older type of mosaic tests.



NEW COLOR-BLINDNESS TEST

Matching color chips, a person with defective vision makes mistakes that a normal person would never make. A minute and a few chips test color-blindness. With 40 chips and more time, the test measures color aptitude.

man for this cause alone. At one time, color-blindness did bar Army recruits. Now, the Army steers such men away from signal work or other duties that require normal color sight, but only for Army commissions or for the flying cadets is color-blindness a disqualifying condition.

That color-blind flying observers might render special service spotting camouflaged objects hidden from normal sight is a war story going the rounds. They might, agreed Miss Nickerson, when asked about it. But—a properly selected color filter of glass would enable an observer with normal vision to do about the same thing. And—the person with normal vision would not be handicapped in other color-sighting situations, as the color-blind might.

Other Tests Tried

The Army, Navy, and other organizations that consider color vision important enough to warrant giving tests, have investigated and relied on a variety of devices. Matching worsteds is one test. A number of tests, such as the Ishihara and Stillings, resemble mosaic patterns of dots. In these, round or pebble-like dots form a pattern of subtly arranged colors, so planned that in each there is a numeral, letter or simple design hidden more or less, or in plain view, according to the color vision of the beholder. These mosaic tests have gained considerable fame in recent years, as a scientific attempt to detect kinds and degrees of defect in color vision.

But of all the tests available, none is rated quite satisfactory for quickly and surely identifying color-blind conditions.

Worsteds Fade

"Worsted samples get soiled from handling or fade," explained Miss Nickerson. "A person with normal color vision may even be too good for this test. He may see that a faded sample is different from a fresher one, and make the mistake of rating the two different, when they should be the same."

And the well-known mosaic tests are not foolproof. It is no secret that these tests can be learned by ill-advised people so bent on concealing color-blindness, or faking it, that they will practise up with coaching, to pass or fail.

"It is very poor judgment to attempt such faking," declared Miss Nickerson, "because if color-blindness is important in a line of work, each person presumed to have normal vision will be relied on to recognize color, as in responding to signals. Sooner or later, a concealed color handicap is bound to be revealed, and it is sheer luck if no damage has been done."

From Russia, Germany, and Japan, mainly, have come these dot design tests for color-blindness. Since they have been a mainstay for testing this condition, there has been apprehension lest foreign supplies of these tests would be cut off. American publishers rising to the occasion have begun turning out similar tests as best they can.

Color experts cautiously point out that it is very difficult to duplicate technically the colors used in such tests. Two charts may look alike on casual inspection, and yet one will differ from the other in a far more important fundamental way. Explained in terms of color science, certain inks absorb and reflect light of given wavelength differently. In one light two blues match. In another light they do not—as every woman shopper who ever tried to match a sample well knows.

American color experts, who have hoped for a better sort of test, believe that the new American invention solves the problem. And, curiously enough, it is a by-product of a much harder achievement in color research.

Need for Aptitude Test

For it was a plea for a color aptitude test that led to the evolution of the color-chip test. A manufacturer of textiles went to consult an eye specialist. He asked whether the physician knew any way of picking out an employee who would be good at detecting color differences in fabrics. The eye specialist said that was a problem for the Inter-Society Color Council, and no easy problem, either. The problem was put up to the Council, and Dr. Deane B. Judd, chairman of the Council, named a committee to tackle it. The committee consists at present of more than a dozen members who represent all types of interest in such a test; physicists, psychologists, and physiologists; representatives of college laboratories, and of military and industrial groups.

Within a year, a method for solving the problem has been found, which is something of a speed record for a task of this sort. And along with it, has come the color-blindness test, which has a far more popular usefulness.

The Inter-Society Color Council, as its name suggests, is made up of specialists in color research who represent 13 national scientific and technical groups, in addition to many members who join as individuals. It is—or was until recently—a unique scientific body, bringing together experts who know color from every angle. To study a color problem, the Council may put together a psychologist, physicist, paint technologist, and lighting engineer. The Council is no longer (*Turn to page 398*)

PALEONTOLOGY

New-Found Fossil Jaw Of Extinct Ape-Man Child

COMPARISON between two fossil genera of remarkable man-like apes, Australopithecus and Paranthropus, found in South Africa in recent years has become possible for the first time through the discovery of a new bit of bone at Sterkfontein, S. A., by Prof. R. Broom of the Transvaal Museum, Pretoria. (*Nature*, May 17.)

The new fossil consists of part of the lower jaw, with teeth, of a Paranthropus baby, about four years old. This enables scientists to make comparisons with a fragmentary jaw of an Australopithecus child just a little older, already in the museum.

The teeth in the new-found jaw are astonishingly human, although the creature is known to have been an ape. The molars have the five cusps or points characteristic of human teeth, plus a tiny extra cusp also often found on human molars.

The teeth in both jaws are of course milk teeth. Dr. Broom remarks on the much closer resemblance they bear to human teeth of the same stage of development than to similar teeth in the young of great apes. The latter, he points out, have become more specialized than man's—have evolved farther away from the original parent stock.

Science News Letter, June 21, 1941

AERONAUTICS

Double Airplane Propeller Used on British Planes

BY USING two airplane propellers on the same shaft, which turn in opposite directions, British fighting aircraft have eliminated many of the difficulties involved in using engines up to 2,000 horsepower, which are now coming into use, to give speeds up to 400 miles per hour and more.

Successful use of the new type, known as the "contraprop," is reported in *Nature* (May 17). It is stated that the device has been particularly useful in the Fleet Air Arm, especially with planes operating from the deck of an aircraft carrier.

As airplane engines have increased in power, it has been necessary to transform this power into pull through the air. At first accomplished by making the propellers bigger, or by increasing the number of blades, a limit for such advances has about been reached, the *Nature* writer points out. However, using two propellers, one placed behind the other, the difficulties are removed, and the design of the undercarriage is simplified, since the swing of the blades is smaller, and there need be less clearance to the ground.

Another advantage is elimination of "airscrew torque." When the propeller turns one way, the airplane tends to turn the other way. With a single-engined plane, there may be a tendency to swing to one side when taking off, but with the contraprop, one propeller's motion cancels that of the other. This is particularly important, it is said, for craft taking off from the confined space of an aircraft carrier, and also it increases the rapidity of certain maneuvers in the air.

The pitch of the blades in each propeller is adjustable, and there is a special control to permit either to be kept in operation if the other is damaged. For fighting purposes, a cannon can be fired through the hub. The weight of the entire contraprop, states the article, need be no greater "than a single propeller capable of absorbing equivalent power."

Science News Letter, June 21, 1941

ASTRONOMY

Third New Comet of Year Discovered in Java

FOR the third time this year, a new comet has just appeared in the sky, Dr. Harlow Shapley, director of the Harvard College Observatory, announced.

It was discovered, he said, by H. van Gent, of the Bosscha Observatory at Lembang, Java, on May 27, according to a cable message received from Dr. W. H. van den Bos, director of the observatory. When found, it was of the eleventh magnitude, too faint to be seen except with a fairly large telescope.

It was then in the constellation of the Southern Crown, which can now be seen from the United States very low in the south about 1:00 a.m., to the left of the hook-shaped figure of Scorpius. Slowly moving in a northwesterly direction, it may come into better view for northern countries, but whether it will brighten or get fainter cannot be told until more observations are made.

Earlier this year astronomers found two other new comets, as well as Encke's periodic comet. All three departed without being visible to the naked eye in the United States, though one of the new visitors was conspicuous in southern countries.

Science News Letter, June 21, 1941

IN SCIEN

RESOURCES

Aluminum for Defense Hits Bird Banding

AMERICA'S aluminum defense needs have created a problem for bird-banding scientists and amateurs, who use thousands of tiny aluminum bands each year.

Manufacturers have material on hand to supply most sizes now to fit wild birds for scientific work, says Dr. Frederick C. Lincoln of the U. S. Fish and Wildlife Service. Beyond that, it remains to be seen whether aluminum can be made available for this purpose.

It takes about 800 pounds of aluminum a year for the little numbered bands which scientists attach to legs of birds in order to trace their migrations and wanderings. Dr. Lincoln weighed samples to figure it.

"We consider bird banding work one of the most important investigations of bird life, because of the specific information gained," he explains.

A larger quantity is used for bands of aluminum tubing attached to racing pigeons. Poultry breeders are also wondering about supplies of aluminum leg bands used in quantity to keep records of good breeding stock.

No substitute for aluminum for bird bands has yet been found, says Dr. Lincoln. In some experiments, copper corroded more rapidly. Monel metal was too stiff for fingers to handle and too costly. Plastics have never been adapted, chiefly for want of a method of stamping serial numbers and other data on the bands while heated.

Science News Letter, June 21, 1941

PHOTOGRAPHY

Daylight Flash Bulbs For Use with Color Film

FLASH BULBS are now available for color photography with the daylight type of color film. The inside of the bulbs are coated with a special clear, daylight-blue lacquer, which acts as a self-contained filter to convert the color temperature of the light from 4,000 degrees Kelvin to 6,000, the equivalent of sunlight. (*Wabash.*)

Science News Letter, June 21, 1941

NE FIELDS

PHYSICS

Auto with Steel Body Safe Place in Lightning

See Front Cover

YOU need not fear lightning if you are out riding in an automobile with a modern steel body and top. Proof of this was given at the Westinghouse high voltage laboratory in Trafford, Pa., when Dr. Gilbert D. McCann sat in such a car while being bombarded with 3,000,000 volts of artificial lightning.

"Although the laboratory lightning stroke hit the car just six inches above my head," said Dr. McCann, "I was safe from injury because modern steel car bodies are effective shields against lightning."

Even the rubber tires produce no difficulty, for the lightning jumps over them from the metal wheel to the ground. In an actual storm, with the road and tires wet, the conduction of the current from the car in this way would be aided.

Dr. McCann said also that the gasoline tank presents no serious hazard. The protected position of the tank is one that lightning can hardly reach. It seeks its nearest target, usually the top of the car.

Science News Letter, June 21, 1941

NUTRITION

Use of School Cafeterias For Defense Workers Urged

THE AMERICAN ARMY is the best fed in the world, but the huge army of workers in American defense industries, airplane production plants and the like, are badly fed and many of them are having trouble finding places to get anything to eat, delegates to the National Nutrition Conference for Defense, called to Washington by President Roosevelt, declared.

The plight of 20,000 workers in an aircraft factory who have no place to eat lunch except standing on the pavement or sitting in their cars outside the factory, and no place to get the food except from hot dog stands, was described by a nationally known nutritionist who refused to allow his name to be used because of possible interference with efforts being made to correct the situation. Their lunches consist of hot dogs or hamburgers and soft drinks. These are all right in themselves, he said, but such a lunch does not supply the vitamins and minerals needed for strength, endurance and the will to work. These young men newly arrived in the community live in bachelor quarters, one of them cooking for his rent. Their dinners consist chiefly of fried meat, white bread, and some butter. They rarely eat vegetables because of the time and trouble needed to clean and prepare them. Occasionally they will open a can of beans for variety.

Immediate steps to remedy the situation all over the country were urged by the delegates who declared that the present emergency will not permit, because of the time factor, the use of educational methods alone to improve the diet of defense workers.

School cafeterias, with their equipment, trained dietitians and corps of workers, might be used to serve breakfasts and dinners to workers in nearby defense factories, Prof. Mary Brian, of Teachers College, Columbia University, suggested as a practical measure that could be instituted rapidly. Large numbers of workers could thus be fed at a time when the school cafeterias are idle anyway.

Science News Letter, June 21, 1941

NUTRITION

Rats' Incisor Teeth Give Picture of Vitamin Action

RATS' incisors, or "eye teeth," can be used in dramatic demonstration of the effects of vitamin D in the prevention of rickets, Dr. J. T. Irving of the University of Cape Town points (*Nature*, May 17.)

The chisel-like incisors of rodents do not have a determinate growth like most other teeth, but keep on growing indefinitely, like hair or fingernails. Constant gnawing keeps them worn down to working length.

Lengthwise sections through incisors of rats that were first kept on a rickets-inducing diet, then given plenty of vitamin D, show clearly in change of structure just when the vitamin began to have effect on the growing region in the jaw, where the limy substance of the tooth was formed, Dr. Irving reports.

Science News Letter, June 21, 1941

AGRICULTURE

Florida Gardens Pinch Hit For France, Italy, Japan

PINCH-HITTING for France, Italy, the Balkans, Japan and a few other countries, Florida is trying its hand at growing some of the foreign specialty imports that war conditions have cut off.

Crops which the Florida State Experiment Station advises as "worthy of trial plantings," though not yet established certainly enough for extensive production, include these:

French endive, formerly imported from France and Belgium. The Everglades area is trying this vegetable, believed likely to have good success.

Tomato paste, formerly imported in quantity from Italy, and made from special, small varieties of tomatoes. "Paste" types of tomatoes are being investigated by several Florida growers.

Sage for seasoning, formerly brought in quantity from Greece. Various sections of Florida are trying this.

Paprika from various Balkan countries. Planted in trials at the Experiment Station farm, paprika gave excellent results. Florida had not yet produced this plant commercially, but Louisiana, South Carolina, and California have.

Spinach seed from Holland and Denmark. One seed grower in Florida's Jefferson County is already raising 100 acres of spinach seed.

Mustard and turnip seed from Japan. These can be grown in Florida, the Station believes.

Teasel burrs from France. Considered especially good for combing wool in American mills, the French type of teasel is to be planted on the Experiment Station Farm for trials.

Science News Letter, June 21, 1941

INVENTION

'Riveted' Men's Socks Will Wear Longer

MEN'S SOCKS will wear three times as long when a new process comes into use in the near future. By immersing the fabrics in a bath of certain colloidal substances suspended in water, the microscopic particles practically "rivet" the fabrics in the twisted threads so that they resist wear. Yet there is no change in their feel or appearance. Also, the untreated pairs showed a shrinkage of 25 per cent, while the treated shrank only 4 per cent. The process may also be used for underwear, blankets, etc. (*U. S. Rubber Co.*)

Science News Letter, June 21, 1941

PSYCHOLOGY—PSYCHIATRY

Low Intelligence May Be Screened Out of New Army

Psychologist Outlines Plan for Giving Practical Tests to All Men Whose Mental Ability Is in Doubt

AMERICA'S new army of rolling tanks and winging airplanes will not be held back by "dumbbell" soldiers who can't understand and promptly carry out their orders, if the Selective Service System follows plans outlined in Atlantic City before the American Psychopathological Association by Dr. F. L. Wells, of Harvard University.

Inadequate mental ability would be screened out of the new army in the same way as flat feet or bad hearts.

That does not mean, Dr. Wells explained, that the less intelligent have no place in the service of the nation.

"It may take Joe Louis to knock out an enemy, but after that a cub scout can tie him," he said. "It is the part of organized defense to see that neither moron nor philosopher need be a 'useless mouth.'"

For mechanized combat units, the men selected could reasonably be restricted to the upper half, intellectually, of the men between 21 and 31 years old. But in an all-out selection for other service of military value in the armed services or among those who manufacture the arms, the upper 95% might be included.

The plan described by Dr. Wells was developed at the Boston Induction Center. There, physicians who are specialists in diseases of the mind examine every selectee to be sure that he has no illness that would make him unfit for military service.

Whenever the psychiatrists had doubts about the mental ability of any man, they sent him to the psychologist for examination.

Fifteen minutes is enough to find out whether the selectee is mentally okay for sending on to the reception center where he will be given the careful interviews and examinations for classification in the army.

This brief 15-minute test is devoted to practical tasks. The selectee will not be required to write long answers to questions or to do a lot of talking. One of the tests worked out for this purpose requires the man to handle such familiar tools as a hammer, paintbrush, or wrench.

This screening out work should be divided between the local board, the medical advisory boards, and the induction center, but as much as possible should be done before the selectee is sent to the Army.

Women psychologists experienced in the testing of adults may take part in this testing for either the medical advisory boards or the local boards.

Science News Letter, June 21, 1941

Queer Characters Barred

QUEER personalities should be barred from the Army by the examining physician who specializes in mental conditions, it is recommended in a report from Dr. Abraham Myerson, Boston psychiatrist, sent to the meeting.

Even when such men are not themselves useless to the Army, they should be excluded because of their disorganizing effect on other soldiers, he said.

These are some of the men Dr. Myerson would keep out of Uncle Sam's armed forces:

1. The man who faints at the sight of blood.

2. The sissy.

3. The odd-looking or clownish fellow who would be jeered at by the other men. Such persons draw trouble to themselves and make trouble for others, perhaps entirely innocently.

4. The chronic liar or swindler type. Other men are roused by them to disgust, anger, and even violence.

5. The natural recluse—the man who finds any attempt to get along with other people painful.

6. The abnormally suspicious or paranoid personality. Such men are sullen and hostile. They are trouble makers and potential disciplinary problems.

7. The man subject to extreme ups and downs of elation and depression. When such moods are not extreme or when they are balanced by other valuable traits, such persons do some of the finest work in the world. But the army can't have men subject to excessive "jags" of being "high" or to suicidal blues.

We can't spread the net too wide, Dr. Myerson warned, or we would exclude the whole Army, for no man is perfect. But men in military life must possess a reasonable capacity for self-control. If they have never had it before induction, they will find little opportunity to develop it later.

Science News Letter, June 21, 1941

Must Teach Laymen

SCIENTISTS must convey their knowledge to intelligent non-scientist adults if democracy is to survive in this emergency, Prof. Adolf Meyer, well-known psychologist of Johns Hopkins University Hospital, told his colleagues at the meeting of the American Psychopathological Association in Atlantic City.

"We must think what to do to save man in this emergency, not just what we are to do about Hitler, or God help man," Dr. Meyer declared.

Intelligent adults must be the leaders in a true democracy, he said, but these leaders must have respect for the rights and welfare of the less gifted and for themselves.

Universities must have, he said, a true university spirit. Although they must continue research in specialized branches of knowledge, they must also see that all the departments and members of the faculty contribute, in cooperation, to a study of the entire wellbeing of man. This universal interest is implied in a literal meaning of the word university.

Every professor, no matter what his subject, should come out of his specialty or his laboratory and tell all the students and intelligent laymen what his studies have to offer for man's welfare.

Even the professor of Sanskrit or Russian can tell of words and meanings that do not exist in English and which would help men. The Russian language has a word for "stand" which conveys also a sense of development or progress, not a mere lifeless stationary quality. English has no such single word as this or the German "Werden." Even the word "static" in Russian conveys a meaning of consistency in development. Such a conception of life and growth bound up with permanence is needed in America today, Dr. Meyer indicated.

On his retirement, soon, from active duty at Johns Hopkins, Dr. Meyer would like to be free to visit universities to share

what they are doing and what they plan to do to protect and further the interests of men as they must live in this disturbed world with a sense for man-science and culture.

Science News Letter, June 21, 1941

MEDICINE

Number of White Blood Cells May Predict Length of Life

Strains of Rats With Low Average White Blood Cell Counts Found to Have Shorter Lives Than Others

PREDICTION of the length of a person's life may, in future, be made from a count of the number of white cells in his blood. This possibility (and so far it is only a possibility) appears from a discovery announced by Dr. Carl Reich, of Lenox Hill Hospital, and Dr. W. F. Dunning, of Columbia University. (*Science,* May 2.)

In rats, they discovered, long life goes with a high count of white blood cells, and particularly with a high count of the type of white blood cells called "neutrophile polys." Strains of rats with low average white cell counts had shorter life spans than strains with high white cell counts.

The white blood cells, and especially the neutrophiles, make up an important part of the body's defenses against invading disease germs.

Sex differences associated with length of life were in accord with the findings. The females had a significantly higher white cell count than the males, and females of most of the strains of rats studied had significantly longer life spans.

Whether or not long life in humans is related to or depends on the number of white cells in the blood, and if so, what can be done about predicting length of life from the blood count or lengthening life by artificially increasing the number of white cells, are questions for the future to answer. In humans, according to one authority, men have higher white counts than women, although the average life span is longer for women than for men. This seems to conflict with the findings in the rats but further study may shed light on this.

Science News Letter, June 21, 1941

PHYSIOLOGY

Gland Extract Added Inches To Height of Dwarfed Boy

THE effect of a gland extract on growth in height was strikingly demonstrated in the case of dwarfed twin brothers reported by Dr. George B. Dorff, Bellevue Hospital, New York City, at the meeting of the Association for the Study of Internal Secretions in Atlantic City.

The gland extract, a sex gland stimulating chemical from the pituitary gland, was given to one of the boys but not to the other. Both were sexually infantile as well as dwarfed. During a period of four and one-half years before the treatment, they grew about seven and one-half inches. Although they were identical twins, developed from the same original egg cell, one of the boys was always about three-fourths of an inch shorter.

When this slightly shorter of the two was given the sex gland stimulating hormone from the pituitary gland, he grew four inches in one year, becoming the taller of the two. The untreated twin brother grew only one and one-fourth inches during the same year.

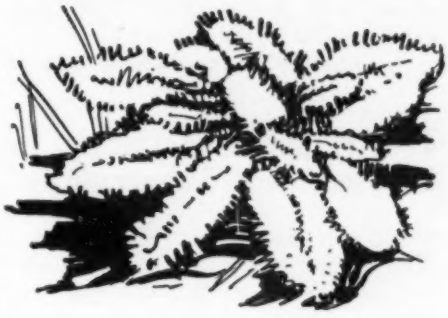
The crystalline male sex hormone, testosterone propionate, markedly accelerated growth in height and weight of seven out of nine undersized boys and young men, Dr. J. S. L. Browne and Dr. Alan Ross, of Montreal, reported.

Two of the boys grew about three inches in six months when given twice weekly injections of this hormone. Definite signs of the growth-stimulating effect of this synthetic male hormone appeared after two months of treatment in a 24-year-old man whose height before treatment was four feet eight inches.

Science News Letter, June 21, 1941

BOTANY

NATURE RAMBLINGS
by Frank Thone



Long-Lived Seeds

THE OLD adage, "One year's seeds means seven years' weeds," will have to be revised—upward. One year's seeds can mean sixty years' weeds, in a few species at least. That is the survival time for seeds of curly dock, evening primrose, smooth mullein and night-flowering catchfly in one of botany's classic experiments, reported by Prof. H. T. Darlington of Michigan State College. (*American Journal of Botany.*)

Sixty years ago a former professor of botany at the college, Dr. J. W. Beal, buried twenty pint bottles, each containing a thousand assorted weed seeds mixed in sand. The idea was to dig up one bottle every five years and find out how many seeds were still viable, and what species they represented.

This five-year schedule was kept up until twenty years ago, when it was decided to make the experiment last longer by digging up the bottles at ten-year intervals. Prof. Darlington has been carrying on the project since 1915.

Of the twenty species originally put away, only four germinated in this latest test. Even these four do not represent a perfectly smooth score, for it was thought that the mullein seeds originally put into the bottles were all of the ordinary woolly species. But the smooth mullein is what came up this time, and also ten years ago, though it had not appeared in any of the earlier plantings. And the catchfly plants are something of a mystery, for there is no record of their seeds having been included at all.

Two species that survived up to the fiftieth year, black mustard and water smartweed, failed to germinate this time.

Species that lasted forty years but were missing at the half-century mark included pigweed, ragweed, peppercress, plantain and purslane.

There are still eleven bottles buried in the soil of the State College campus. If the ten-year interval schedule is kept up, the end of the experiment will not be reached until the middle of the twenty-first century.

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MEDICINE

Test Hopeful Chemical Treatment of Tuberculosis

THE first group of tuberculosis patients to be treated with promin, new sulfa drug which Mayo Clinic scientists have found a promising remedy for tuberculosis in guinea pigs, will have to be followed for at least one year before the doctors will know whether or not this drug can "cure" tuberculosis in humans as it does in guinea pigs.

Small doses of this drug can be safely given to patients, Dr. H. C. Hinshaw reported to the American Medical Association.

This much, but no more, has been learned from a careful trial in a limited number of patients during the last two months. This trial followed extensive trials of the remedy in guinea pigs infected with human tuberculosis germs. The drug apparently eradicated the disease in guinea pigs, Dr. W. H. Feldman had previously reported. The disease in guinea pigs, even though produced by the same germ as causes tuberculosis in humans, is, however, an entirely different disease, the Mayo Clinic scientists emphasize.

Promin, which is a sugar-containing relative of sulfanilamide, has not yet been released for general distribution. It is a "definite poison," Dr. Feldman said, and must be handled with discretion as is the case with many other drugs.

Finding a dose that can be safely given to humans is therefore considered something of a triumph for its first two months of clinical trial, but it is far too early to say whether or not it will benefit these tuberculosis patients. In fact, it is too early even to expect to find evidence of any effect of the drug in X-ray pictures of the lungs. Doctors generally set three months as the interval between X-ray pictures to check on the course of tuberculosis and these patients have only had promin for two months.

Tuberculosis patients and their relatives are warned not to hope for too much from the first report of clinical use of this drug, and not to expect to be able to get it.

Promin has also been tried on patients suffering with various other ailments such as pneumonia and staphylococcus and streptococcus infections. The results were encouraging but Dr. Hinshaw believes that other sulfa drugs are perhaps a little better in pneumonia and that there is no reason to change to promin treatment in this disease.

Science News Letter, June 21, 1941

ENGINEERING

Substitutes in Automobiles Superior in Many Instances

SUBSTITUTE materials adopted for automobile parts, because the old materials are needed for defense, in some cases "will stay permanently after the emergency is over, since they will have time to prove their worth, demonstrating hitherto undiscovered qualities," Thomas A. Bissell, Technical Editor of the S. A. E. Journal, told the Society of Automotive Engineers.

"In addition," he added, "the cost of many of these parts will have been lowered through design and production development. This is one of the brightest spots in the picture since the exigencies of the emergency will force many developments that would not have been made under normal conditions."

Pointing out some of the difficulties encountered, he said: "In considering alternate materials for certain parts in the automobile, engineers working for the best interests of national defense often find themselves in a dilemma. Substitution of the alternate material will release a relatively small amount of material needed for defense, when compared with that released by replacing other parts, but production of the alternate parts requires extra machining and processing, entailing additional machine tools, machinists, and other skilled labor needed just as urgently in defense industries as is the critical material itself.

"The example most often cited to illustrate this problem is that of carburetors made of critical zinc alloy versus those of alternate cast iron. The zinc-alloy carburetor die castings weigh little when compared with zinc-alloy radiator grilles; also, they require virtually no machining or processing. Cast iron carburetors, on the other hand, would require additional batteries of machine tools to perform the necessary finishing, drilling, and facing operations."

Science News Letter, June 21, 1941

MEDICINE

Prevention of Diabetes Possible, Dr. Best Suggests

A REQUEST to American doctors to carry on war-interrupted efforts of Canadian scientists to test on humans a promising method of diabetes prevention was made by Dr. C. E. Best, of Toronto, co-discoverer of insulin, and his associate, Dr. H. E. Haist,, at the meeting in Cleveland, for the first time anywhere, of the newly-organized American Diabetes Association.

By giving insulin, a diet high in fat content, and also by fasting, the Canadian scientists have succeeded in preventing diabetes in dogs. By any of these procedures the amount of insulin in the dog's pancreas is reduced, indicating that the insulin-producing cells of the pancreas are being given a chance to rest. Overwork of these cells with consequent breakdown of insulin-producing ability results in diabetes.

The hereditary tendency to diabetes has been so well established that Dr. Best and his associate believe the measures which prevented diabetes in dogs should be tried, under carefully controlled conditions, to protect children of diabetic ancestry from developing the disease. They have not been able to make such a trial, Dr. Best explained, because

war has called to England for military service the doctor in the University of Toronto medical faculty who would be able to make arrangements for the trial. Dr. Best's own activities are limited to laboratory research.

A means of diagnosing diabetes in its early stages is badly needed, Dr. Best declared, pointing out that at present doctors do not see diabetic patients until most of the insulin-producing cells in the patient's pancreas are destroyed.

The death rate from diabetes is rising "at an alarming rate" and so is the number of cases, in spite of efforts being made to fight this disease, Dr. Cecil Striker, of Cincinnati, president of the new association, declared in outlining methods by which the association hopes to aid the three-quarters of a million diabetics in the nation.

Science News Letter, June 21, 1941

POPULATION

U. S. Can Expect as Many Indians By 1980 as in 1492

Present Trends Indicate Indian Population Will Exceed 700,000 Within the Next Forty Years

REVERSING the vanishing red man trend, Indians in the United States are now multiplying so rapidly that by 1980 the country may actually expect to have as many Indians as when Columbus landed in 1492.

Reporting this prospect to the Institute on the Future of the American Indian, in New York, Dr. Frank Lorimer, director of population studies at American University, predicted an Indian population exceeding 700,000 and possibly reaching 750,000 in the next 40 years, judging by present trends. There are now about 360,000 Indians, and in Columbus' time, by conservative estimates of anthropologists, there were 700,000 to 800,000.

Birth control in Indian families was proposed by Dr. Lorimer, as one solution to the Indians' future economic worries which will increase if their numbers grow too rapidly.

Declaring that, aside from health hazards, the problems of rapid population increase are clearly economic, Dr. Lorimer said:

"I venture the suggestion that it may be wise to proceed along all three of the possible lines of solution I have suggested—allocation of new lands, development of new economic techniques, and limitation of births."

What these solutions would mean to tribal life, the cultural and political changes involved, the sociologist added, are questions for study by specialists on Indian life.

Dr. Lorimer advocated more attention to studying Indian population trends, to gain facts needed in understanding Indian problems in different areas.

Possibility of establishing population registers in various areas, where a continuous record of Indian births, marriages, migration, and deaths could be kept was suggested, as one way of supplementing census data. Such registers are kept in European countries under church or civil authorities, Dr. Lorimer pointed out.

That Indians, whom some scientists rate the world's healthiest people in pre-Columbian times, are on a new upgrade in health, was reported by Dr. J. G. Townsend, former medical director for the U. S. Office of Indian Affairs.

Indians in the United States still have more tuberculosis and more trachoma than the general population, he stated. But blame for the tuberculosis can be laid to economic ills, in Dr. Townsend's opinion, not to any special predisposition of the Indian race to this disease. Indians, he said, are now developing a natural immunity to tuberculosis.

Hope that trachoma, once a terrible scourge to Indian eyesight, will be wiped out in a few years was forecast by Dr. Townsend. The discovery by Indian Service physicians and consultants that trachoma is caused by a virus and that it can be made non-infectious by sulfanilamide treatment is having world-wide repercussions, bringing hope to other peoples afflicted by the disease.

Pointing out that the newer hospitals for Indians have laboratories well equipped for research, Dr. Townsend suggested important opportunities for study. The rarity of cancer among Indians and the supposed peculiar immunity of Navahos to scarlet fever, he cited as points worthy of investigation, with benefit to Indians and possibly to the world at large.

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RESOURCES

Cork Trees, Rubber Bushes Being Grown in California

CORK trees from Spain and rubber bushes from Mexico are being cultivated in California State Experiment Station nurseries, in an effort to replace supplies from abroad, diminished or threatened with total cut-off by disturbances overseas.

During the coming autumn, 10,000 cork oak seedlings will be distributed free of charge to all persons presenting satisfactory evidence that they can plant and care for 50 or more trees. Experimental plantings in various parts of the state have already indicated that California's soil and climatic conditions are as suitable as those of Spain for the successful production of cork.

The rubber bushes are of the species known as guayule, native to Northern Mexico, of which there are already successful plantations in the southern part of the state. The new stocks being grown are in a nursery sponsored by the Continental Rubber Company, whose directors wish to learn whether guayule can be successfully produced in the interior valleys of California.

Guayule does not produce its rubber in the form of latex or milky sap, as most commercial rubber plants do. Its rubber occurs in solid particles and shreds embedded in the plant tissues, constituting from 18 to 20 per cent. of the plant's weight. It is extracted by grinding up the plant in water, which permits the rubber particles to float to the top.

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Books

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CHEMISTRY

New Glare-Eliminating Screen 99.99 Per Cent Efficient

Made of Invisible, Submicroscopic Molecules That Line Up Light Waves to Vibrate in Same Direction

A NEW type of glare-eliminating screen for automobiles and other purposes, claimed to be 99.99% efficient, was recently patented by Edwin H. Land, scientist-president of the Polaroid Corporation. It is the first to use invisible, submicroscopic molecules instead of crystals to line up light waves so that they all vibrate in the same direction, and can be partly or wholly cut off by another sheet of the same material set at an angle to the first. It is also the first to be made of wholly synthetic materials, all obtainable in the United States, so that no imaginable accident of war and blockade can cut us off from the supply.

Previous polarizers, used in sun glasses, lamps, etc., have employed minute crystals (usually of quinine) embedded in a plastic sheet. The new one, known as Type H, uses one of the new synthetic, rubber-like plastics known as polyvinyl alcohol. This is stretched out from three to eight times its original length, which gets its molecules all parallel with each other; then it is exposed to an iodine solution, which renders the molecules able to filter the light into all-one-way (polarized) waves.

Use of polarizing sheets as headlight glare eliminators has been contemplated for a considerable time. If the headlights are screened at an angle of 45 degrees so that they will send out only polarized light waves, and if the driver uses a similar screen on his windshield, the blinding glare of oncoming headlights is eliminated. The new kind of Polaroid promises to bring headlights and eye-screens of this kind closer to realization.

The new Type H Polaroid is said to transmit a third more light than earlier types of polarizing sheets, and yet when two sheets are turned at right angles to each other practically no light at all gets through. In tests with the sheets turned completely at right angles, a hundred-watt lamp behind them became completely invisible.

Almost perfect freedom from color, together with high efficiency and polarizing power, are expected to make the new sheeting especially suitable for scientific and military optical instruments, camera filters for color photography, projection of three-dimensional pictures without color distortion, glareless illumination for stores, desks and art galleries, and for other purposes.

The materials used in the wholly synthetic polarizing sheeting are coke, lime, air, water and iodine.

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unique, because, in the midst of blitzkriegs, British scientists under the sponsorship of the National Physical Society, have succeeded this very year in forming a similar color group in England. That such an organization should be considered worth starting in wartime, and should schedule its meetings ahead, is significant. It indicates the importance which scientists attached to color research problems.

For testing color aptitude, the committee of American scientists has evolved several series of 40 color chips. The first two of these series are graded in such delicately progressive steps from a middle gray to a yellowish red and from gray to a purplish red, that it takes superior color vision to place a duplicate chip below the one chip in the series that it does perfectly match.

Producing these chips called for high technical skill, since the gradations are very uniform, as tested by spectrophotometric measurement. The chips in a series are all of the same brightness, differing only in degree of color.

For workers who test fabrics, or deal in color differences of cotton fiber—which is Miss Nickerson's line of color research in the U. S. Department of Agriculture—it is important to have ability to detect fine color differences.

No one who has tried thus far has achieved 100 percent. success in matching all chips. Among the most skillful have been scientists from the National Bureau of Standards, who have been among the individuals who have taken the test experimentally.

By giving the test to many people, the committee is now standardizing it, that is, finding out accurately what rating an individual should make to be considered excellent, good, poor, at discriminating color differences. When thus scaled, the test will be ready for use.

The color-blindness test, which the Council calls a by-product, consists of certain chips from a series, producing a simplified problem for a tested person to solve. With these chips, color-blindness can be detected in a minute. But finding out how much aptitude an individual has for color discrimination may be a chip-matching problem of an hour, or even longer.

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RADIO

'Radio Wave Sprinkler' Aids Forest Fire Fighters

A "RADIO wave sprinkler" will be used to aid fire-fighting crews in National Forests this summer. It is an automatic relay station that picks up radio waves from one point, and transmits them to another, using an automatic relay of portable size which is operated by batteries. Thus it permits the short-range, light-weight radios developed for parachute fire-fighters last spring to communicate with headquarters, even at relatively long distances. (*U. S. Forest Service.*)

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•First Glances at New Books

Additional Reviews On Page 400

GENERAL SCIENCE—BIOGRAPHY

AMOS EATON, Scientist and Educator, 1776-1842—Ethel M. McAllister—*Univ. of Penn. Press,* 587 p., $5. The detailed and authoritative biography of a fascinating pioneer in American intellectual life, who played a leading role in the founding and organizing of what is now Rensselaer Polytechnic Institute.

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GENERAL SCIENCE—EDUCATION

THE ORIGINS AND DEVELOPMENT OF ELEMENTARY-SCHOOL SCIENCE — Orra E. Underhill — *Scott, Foresman,* 347 p., $2.50. Smatterings of science are found in almost the earliest of books intended for teaching children. This historical study in educational methodology traces up through the decades the teaching of science to the younger ages.

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MATHEMATICS

TABLE OF POWERS GIVING INTEGRAL POWERS OF INTEGERS—British Association for the Advancement of Science; Initiated by J. W. L. Glaisher, extended by W. G. Bickley, C. E. Gwyther, J. C. P. Miller and E. J. Ternouth—*Cambridge (Macmillan),* 132 p., $4.25. (Mathematical Tables, Vol. IX). The basis of these tables was prepared many years ago by Dr. Glaisher, and then, mysteriously, suppressed. Fortunately a copy survived, and the present volume is the result. The tables are useful in many branches of mathematics.

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GEOGRAPHY

ALABAMA, A Guide to the Deep South —Alabama Writers' Program of the Work Projects Administration—*Richard R. Smith,* 442 p., illus., $2.75. For tourists, who travel these days with increasing desire to see more than routine "sights," this book offers eye-openers to the industry, history, romance, and natural beauty of a southern state. Nineteen motor tours, arranged in detail, are one feature of the guidebook. For stay-at-homes who want to know more about Alabama there is much information not heretofore available in general reading.

Science News Letter, June 21, 1941

ARBORICULTURE

PRUNING TREES AND SHRUBS—Ephraim Porter Felt—*Orange Judd,* 237 p., illus., $2. A highly useful manual that will be welcomed by landscape architects, park administrators, orchardists, gardeners and all others who have trees in their care. It covers its subject in all possible fields—orchards as well as ornamental plantings, city streets as well as country highways.

Science News Letter, June 21, 1941

GENERAL SCIENCE

THE PROGRESS OF SCIENCE, A Review of 1940—H. Horton Sheldon, ed.—*Grolier Soc.,* 442 p., illus., $7.50. In encyclopedic alphabetic arrangement, the essence of last year's progress in science has been distilled and processed by several score of specialists marshaled by the editors of this first volume of a new yearbook. Leading personalities are given biographical notice. Ample photographs aid the presentations.

Science News Letter, June 21, 1941

ELECTRICITY

POWER FACTOR PROBLEMS IN ELECTRICITY SUPPLY—G. W. Stubbings—*Chemical Pub. Co.,* 174 p., $3.50. The power factor is a useful means of measuring electrical consumption, especially by large users, and hence has considerable importance in electrical engineering. This little book, of British origin, explains what it is and how it is applied.

Science News Letter, June 21, 1941

ENGINEERING

AUTOMOBILES FROM START TO FINISH (rev. ed.)—Franklin M. Reck—*Crowell,* 96 p., illus., $2. Not only the automobile itself and its manufacture are discussed in this fully illustrated book, but such related topics as roads, gasoline, and tires.

Science News Letter, June 21, 1941

CHEMISTRY—CRIMINOLOGY

FORENSIC CHEMISTRY—Henry T. F. Rhodes—*Chemical Pub. Co.,* 214 p., $5. Of English origin, this book covers poisons and their identification, chemical identification of explosives, examination of questioned documents, methods of fixing fingerprints, and many other problems of chemistry involved in the detection of crime.

Science News Letter, June 21, 1941

MEDICINE

WHAT PRICE ALCOHOL?—Robert S. Carroll—*Macmillan,* 362 p., $3. Information about alcohol and its effects and advice for its victims with liberal illustrations from case histories.

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AERONAUTICS

AERONAUTICS IN THE UNION AND CONFEDERATE ARMIES, WITH A SURVEY OF MILITARY AERONAUTICS PRIOR TO 1861, Vol. I—F. Stanbury Haydon—*Johns Hopkins Press,* 421 p., 45 pl., $4. Surprising it seems at first to realize that aeronautics played any part in the Civil War, before the Wright brothers were born. Of course, there were no airplanes at that time, but balloons, free as well as captive, played a part. This account ends in 1862; presumably later volumes will carry it to the end of the Civil War.

Science News Letter, June 21, 1941

NUTRITION—CHEMISTRY

CHEMISTRY OF FOOD AND NUTRITION (6th ed.)—Henry C. Sherman—*Macmillan,* 611 p., illus., $3.25.

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CHEMISTRY

SIMPLE CHEMICAL EXPERIMENTS—Alfred Morgan—*Appleton-Century,* 269 p., illus., $2. A practical manual of things that the amateur chemist can do in a home laboratory. To the relief of parents, though doubtless to the youngster's regret, the making of high explosives is omitted.

Science News Letter, June 21, 1941

ENGINEERING

AMERICAN PLANNING AND CIVIC ANNUAL, 1940—Harlean James, ed.—*American Planning and Civic Assoc.,* 278 p., $3. Everyone interested in planning for the better world that should come with the return of quieter times (and we all should be doing that) will welcome this addition to what has already become a notable series.

Science News Letter, June 21, 1941

BOTANY

AN OUTLINE OF GENERAL BOTANY—Harry J. Fuller—*Barnes and Noble,* 180 p., illus., 75c. A compact manual, useful either as a brief text or as a guide in general review for advanced students who feel the need for a brushing-up.

Science News Letter, June 21, 1941

MATHEMATICS

FUNCTIONS OF A COMPLEX VARIABLE WITH APPLICATIONS—E. G. Phillips—*Interscience Pub.,* 140 p., $1.50. This English book, in the series of "University Mathematical Texts," deals with a subject of great importance in advanced mathematics.

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•First Glances at New Books

Additional Reviews On Page 399

DAIRY INDUSTRY

SEVEN DECADES OF MILK, A History of New York's Dairy Industry—*John J.* Dillon—*Orange Judd,* 340 p., $3. With the emphasis now being placed on nutrition as a public responsibility, this book, telling of the acuteness of the milk problem in America's biggest urban community, and the magnitude of the efforts made toward its solution, should command wide interest and contribute substantial aid to those dealing with the same problem in other cities.

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MATHEMATICS—ASTRONOMY

THE ANALYTICAL FOUNDATIONS OF CELESTIAL MECHANICS—Aurel Wintner—*Princeton Univ. Press,* 448 p., $6. This newest addition to the Princeton Mathematical Series, naturally, is highly technical. However, the properly qualified reader can learn the profound way in which the rest of mathematics has been affected by researches in celestial mechanics.

Science News Letter, June 21, 1941

HORTICULTURE

MODERN FRUIT PRODUCTION—Joseph Harvey Gourley and Freeman Smith Howlett—*Macmillan,* 579 p., illus., $4.50. A text and reference book for fruit growers. It not only gives clear instruction in the practical phases of planning, planting and caring for fruit trees and bushes, but prefaces this with sections on the economics and botany of fruits, thus laying a sound scientific foundation before undertaking the superstructure of application.

Science News Letter, June 21, 1941

PHYSICS

PHYSICS, The Pioneer Science—Lloyd William Taylor—*Houghton Mifflin,* 891 p., $4. The historical approach is effectively used in this new text-book, now appearing in print for the first time after the author, who is professor of physics at Oberlin College, tried it out in mimeographed form on several generations of his students.

Science News Letter, June 21, 1941

AGRICULTURE—ECONOMICS

A SURVEY OF INSECTICIDE MATERIALS OF VEGETABLE ORIGIN—H. J. Holman, ed.—155 p., $1.05. THE TUNG OIL INDUSTRY OF THE UNITED STATES—Report of an inquiry . . . by M. Ashby—28 p., 30c. THE WORLD'S CINCHONA BARK INDUSTRY—Imperial Institute—28 p., 30c, *British Library of Information.* Three manuals of much interest in this country, as well as in Britain where use was primarily intended. The publication on insecticides is of particular interest at the present time, when normal trade in such materials as pyrethrum and derris has been badly interfered with.

Science News Letter, June 21, 1941

GENERAL SCIENCE—HISTORY

STUDIES IN THE HISTORY OF SCIENCE—E. A. Speiser and others—*Univ. of Penn. Press,* 123 p., $1.50. Eight important papers delivered at the bicentennial conference of the University of Pennsylvania. The authors are: Otto E. Neugebauer, E. A. Speiser, Hermann Ranke, Henry E. Sigerist, Richard H. Shryock, Evarts A. Graham, Edgar A. Singer and Hermann Weyl.

Science News Letter, June 21, 1941

CHEMISTRY

ORGANIC CHEMISTRY—Francis Earl Ray—*Lippincott,* 706 p., $4. Such recent advances in organic chemistry as the developments in medicine with the use of sulfanilamide and related drugs have necessitated, the author points out, "a revaluation in the materials and methods of presentation in the introductory course."

Science News Letter, June 21, 1941

PHYSICS

AN INTRODUCTORY COURSE IN COLLEGE PHYSICS (rev. ed.)—Newton Henry Black—*Macmillan,* 734 p., illus., $3.75. Experiments and practical applications of physical principles are emphasized in this new edition of a popular text.

Science News Letter, June 21, 1941

PUBLIC HEALTH—ENGINEERING

PLANNING REFUSE COLLECTION OPERATIONS, *Bulletin* No. 13—*American Public Works Assn.,* 48 p., 50c.

Science News Letter, June 21, 1941

ENGINEERING—ECONOMICS

PETROLEUM FACTS AND FIGURES (7th ed., 1941)—*American Petroleum Institute*—192 p., $1. A useful collection of statistics, now brought up to date.

Science News Letter, June 21, 1941

ECONOMICS

STATISTICS OF THE COMMUNICATIONS INDUSTRY IN THE UNITED STATES FOR THE YEAR ENDED DECEMBER 31, 1939—Federal Communications Comm.—*Govt. Print. Off.,* 267 p., 25c.

Science News Letter, June 21, 1941

FIRE PROTECTION

FIRE DEFENSE—Horatio Bond, ed.—*National Fire Protection Association,* 221 p., illus., $1.50. A manual for firefighters in war-threatened zones. Practical and complete, it embodies many lessons taught by experiences in bombed cities in the present war. It should be on the reading table of every fire department and every industrial plant in the country—and it should not just be there, but should be "read to pieces" by the fire-protection personnel.

Science News Letter, June 21, 1941

PALEONTOLOGY

WHEN THE WORLD WAS YOUNG—Martha McBride Morrel; illus. by R. E. Falconer—*Houghton Mifflin,* 252 p., illus., $3. A popular book on paleontology and prehistoric man, which makes the story of early life on earth sound really exciting. This book should appeal to young people of the 'teen ages, as well as to such of their elders as have not lost the capacity for wonder. The illustrations are attractive.

Science News Letter, June 21, 1941

ANTHROPOLOGY—BIOLOGY

MAN, THE MECHANICAL MISFIT—G. H. Estabrooks—*Macmillan,* 251 p., $2.50. The professor of anthropology at Colgate University offers a popular essay on man and what's wrong with him, so far as his physical makeup is concerned. The style is lively and stimulating, calculated to make at least some of the facts and opinions here set forth stick in the minds of readers who might otherwise straightway forget what manner of man they are.

Science News Letter, June 21, 1941

BIOLOGY

ANIMAL BIOLOGY (3d ed.)—Michael F. Guyer—*Harper,* 723 p., illus., $3.75. A new edition of a well-established and successful text.

Science News Letter, June 21, 1941

ENGINEERING

MODERN MARINE REFRIGERATION—Earl S. Shulters—*Cornell Maritime Pr.,* 156 p., illus., $2. The importance of refrigeration in ships has been increased in recent years with the air conditioning of passenger quarters and, lately, the need for more refrigerated bottoms to carry food supplies to Britain. This handbook gives necessary information about the most used systems.

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